

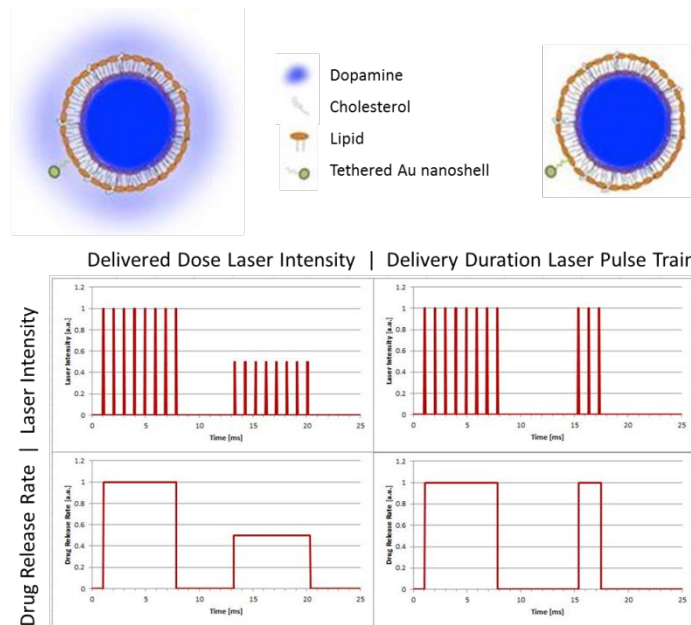
DDS with sub-second temporal release profile

The Problem

In contrast to neuro-transmitters, which are released on sub-second time scales, conventional drugs administered intravenously or orally are released over prolonged periods of time.

The Solution

The drug is encapsulated in liposomes with gold nano-shells tethered to them. The liposomes are introduced into the tissue and irradiated by a femtosecond laser releasing the drug. The delivered dose is determined by the laser intensity, and the temporal profile of the drug release by the pulse train characteristics (see figure).



Upper left shows a liposome that is being irradiated releasing dopamine, the upper right shows the liposome in the normal state (not being irradiated). Graphs on the left show laser intensity and associated drug release rates and those on the right control of duration of drug delivery; all time scales are in ms.

Applications

- Study of Parkinson's disease
- Cancer treatment
- Endocrine disorders

Opportunity

- Collaborative research
- Licensing

Patent protection

This technology has entered the National Phase as EP14870369.7, US15/103,423, and JP2016-538816.

For more information

Technology Licensing Section at bdtl@oist.jp or +81-(0)98-966-8937